A NOTE ON THE POSSIBLE REPRODUCTIVE STRUCTURES IN KENYAN *UDOTEA ORIENTALIS* A. & E. S. GEPP, (CHLOROPHYTA).

by

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INTRODUCTION

The genus *Udotea* is pan-tropical with extra-tropical (Natal Coast) extensions. *Udotea orientalis* A. & E. S. Gepp is an Indo-Pacific species. It has been reported from Kenya (Gerloff, 1960; Isaac, 1967), Mosambique and Natal coast of South Africa (Isaac, 1956). The Siboga Expedition records include Zanizbar in the Indian Ocean list; in the Pacific Ocean it has been reported from Queensland (Australia), China Sea and Japan (A. & E. S. Gepp, 1911).

U. orientalis is widespread along the Kenya coast but it is generally less common than *U. indica* A. & E. S. Gepp. A third species *U. flabellum* (Ell. & Soland) Howe has been recorded for the Kenya coast (Isaac, 1967), but so far has only been found in the Lamu region (personal communication). *U. orientalis* is primarily an alga of quiet or protected waters such as those to seaward of mangroves and in lagoons. It is sometimes found in more exposed situations but not so much as *U. indica.*

The morphology of *Udotea* is well known and has been fully described by Gepp (1911). There is, however, no certain information and few published records of the reproductive structures, and hence it is worthwhile recording the observations made on the Kenya material of *U. orientalis.*

THALLUS STRUCTURE

(a) **External morphology**

The thallus of *U. orientalis* consists of a well differentiated stipe and frond (fig. 1a). The stipe arises from a bulbous rhizoidal mass and may be up to 2.5 cm. long and up to 3 mm. thick. The frond is well developed, broad and cordate in shape. It varies in size according to the habitat. Generally, those growing in quiet waters are larger than those growing in disturbed waters. The frond may be up to 6.5 cm. broad and 4 cm. long. It is concentrically zoned and longitudinally striate due to moderate calcification. The margin of the frond may be entire or lacerate.

(b) **Internal structures**

The frond is built up of smooth-walled coenocytic filaments which radiate from the stipe to the margin of the frond. The filaments are repeatedly dichotomously branched and show constrictions at markedly unequal distances above the points of dichotomy (fig. 1b). This is a characteristic feature of this species. The filaments vary from 24μ to 35μ in diameter and are packed with starch granules and chloroplasts.

POSSIBLE REPRODUCTIVE STRUCTURES

Phillips reported a small ovoid body at the apex of one filament of Atlantic species *U. cyathiformis* Decaisne, and suggested a similarity between it and the female gametangium of *Codium* (Phillips, 1957). Phillips observed a wall at the base of the organ. The wall was thinnest in the middle, where he also observed cytoplasmic strands between the filament and the organ. He concluded that the wall was newly formed. He ruled out the possibility that this organ might be a normal growth phenomenon, with the other new filament of the dichotomy broken off, because the point

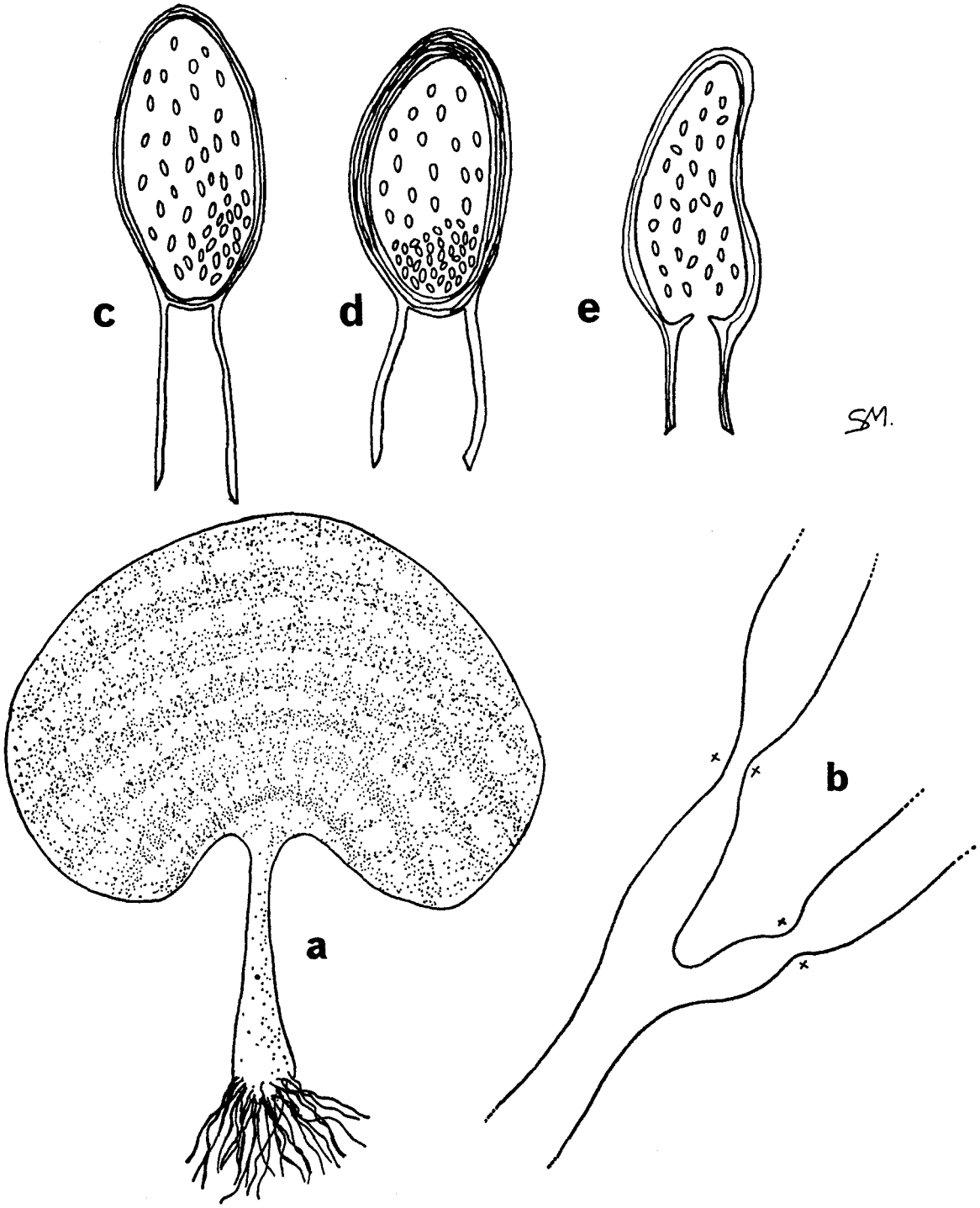

Fig. 1. *Udotea orentalis* A. & E. S. Gepp, a, whole plant (x 1); b, filament showing dichotomous branching (x 200); c, ovoid body at apex of filament (x 200); d, ovoid body showing thicker wall (x 200); e, filament with ovoid body, showing slight ingrowths of filament walls (x 200).

of constriction was above the dichotomy and no branching or trace of branching was evident. The organ was dark green and so he concluded that it was not a vegetative growth but a female gametangium.

POSSIBLE REPRODUCTIVE STRUCTURES IN KENYA *U. ORIENTALIS*

In October, 1967, during an algology practical class at the University College Nairobi, when the author was examining teased filaments of *U. orientalis*, she came across an ovoid body at the apex of one filament (fig. 1c).

On careful examination and comparison with Phillips' drawing of a similar structure in *U. cyathiformis*, very close similarities were observed except that the cytoplasmic strands mentioned by Phillips were not observed.

An extensive search for similar structures was carried out on herbarium and preserved material. While examining filaments of preserved material of *U. orientalis*, Isaac B. 27 and 3221 from Mokowe mud flats Lamu, Kenya, in front of mangroves, the author came across another ovoid body at the apex of a filament (fig. 1d).

The ovoid body measured 105μ in length and the greatest width was 30μ. The width of the filament bearing the body was 24μ. Examination of the body under oil immersion revealed that the basal wall of the organ was complete and also that the wall surrounding the body was thicker than the filament wall. The thickness of the wall surrounding the ovoid body was 4.5μ compared to 3μ of the filament wall. The basal wall of the body was of the same thickness as that surrounding the body itself. Thus the organ was completely isolated from the filament and hence the body is very likely a mature gametangium. It was also observed that the basal half of the gametangium was packed densely with roundish bodies.

Phillips suggests in his paper on *U. cyathiformis* that it is probable that the basal wall of the organ arises by ingrowth of filament walls at the organ base. During the course of extensive examinations for similar ovoid shaped bodies at the apex of filaments, a body was observed with slight ingrowths of the filament walls as shown in fig.1e. These ingrowths were visible under a phase contrast microscope. This observation is in agreement with Phillips' suggestion of the origin of the basal wall of the organ.

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LITERATURE CITED

GEPP, A & G. S. The Codiaceae of the Siboga Expendition, Siboga Expedition Monograph L x II Leyden, 1911.

GERLOFF, JOHANNES, 1960. Meeresalgen aus Kenya, 1, Cyanophyta & Chlorophyta, *Willdenowia*, **2**, 4: 604–627.

ISAAC, Wm. EDWYN, 1956. Marine algae of Inhaca Island and Inhaca Peninsula. *J. S. Afr. Bot.* **22** : 171.

1967. Marine Botany of the Kenya Coast *J.E. Afr. nat. Hist. Soc.* **36**, (114) : 75–83.

PHILLIPS, R. C., 1957. "Notes on gametangia in Udotea". *Quart. J. Florida. Aca. Sc.* **20** : 253–254.

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